

A NEW EURYHALINE SPECIES OF *MONOPYLEPHORUS*
(OLIGOCHAETA: TUBIFICIDAE) FROM
THE SOUTHERN UNITED STATES

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A B S T R A C T

Monopylephorus helobius n. sp. is described from material collected from a Louisiana salt marsh, the northern coast of Florida, a fresh-water swamp, and a saline river in Texas. The species is distinctive in having setae with short distal teeth. The male duct, although covered with bands of muscle, is similar to that of *M. rubroniveus* Levinsen.

A previously undescribed species of *Monopylephorus*, *M. helobius* new species was collected from brackish and fresh water in Louisiana, from brackish water in northern Florida, and from the saline Pecos River in western Texas. The species seems intermediate between *M. limosus* (Hatai, 1898) and *M. rubroniveus* Levinsen, 1884.

Monopylephorus helobius new species

Figure 1A-C

Holotype.—NMNH 56186. Louisiana: Lafourche Parish. NE end of Lake Palourde. 29°32'44"N, 90°14'04"W. 12 July 1975. W. Burke.

Paratypes.—NMNH 56187. Same locality and date as holotype. 1 specimen. LSU 1922. Same locality and date as holotype. 2 specimens.

Additional Collections.—NMNH 56188. Louisiana: Ascension Parish. 4.1 km ESE Sorrento. 6 May 1977. M. S. Loden. 2 specimens. LSU 1924. Same locality and date. 5 specimens. NMNH 56189. Texas: Pecos County. Pecos River at Girvin. 22 April 1976. J. R. Davis. 7 specimens. LSU 1923. Same locality and date. 5 specimens (1 serially sectioned). LSU 1938. Florida: Franklin County. Apalachicola Bay at East Point. 8 March 1978. W. J. Harman and M. S. Loden. 1 specimen.

Etymology.—Derived from the Greek "heleos" (marsh).

Description.—Length 6–10 mm (preserved); 40–78 segments. Diameter at segment II 200 μ m, 400 μ m at VIII, 450 μ m at XI, 300 μ m at XX, 120 μ m at pre-periproct. Body cavity with few to many coelomocytes. Prostomium triangular, shorter than width at peristomial junction. Setae all bifid crotchets, distal tooth shorter and thinner than proximal; anteriorly 3–4 per bundle, 56–79 μ m long; posteriorly 2 per bundle, 56–72 μ m long. Setae absent ventrally in XI. Clitellum extending from 9/10 to 12/13, absent from area around midventral bursa of XI. Male reproductive system with all structures paired. Testes on posterior wall of septum 9/10. Male funnels approximately 55 μ m diameter, located ventrolaterally just anterior to septum 10/11. Vasa deferentia ciliated, approximately 40 μ m long, transitioning into elongate atria 250–300 μ m long. Atria divided into two portions: proximal portion covered dorsally with varying amounts of diffuse prostatic tissue, thin-walled, 15–20 μ m diameter, with ciliated lumen; distal portion dilated, lacking cilia and prostatic tissue, 35–50 μ m diameter, covered with bands of circular muscles (Fig. 1A, B). Atria joined distally to muscularized pseudopenes by constrictions of the ducts; pseudopenes spindle-shaped, 150–175 μ m long, maximum diameter approximately 50 μ m. Male ducts terminate laterally in mid-ventral bursa, approximately 125 μ m diameter. Spermathecae paired. Ampullae 50–75

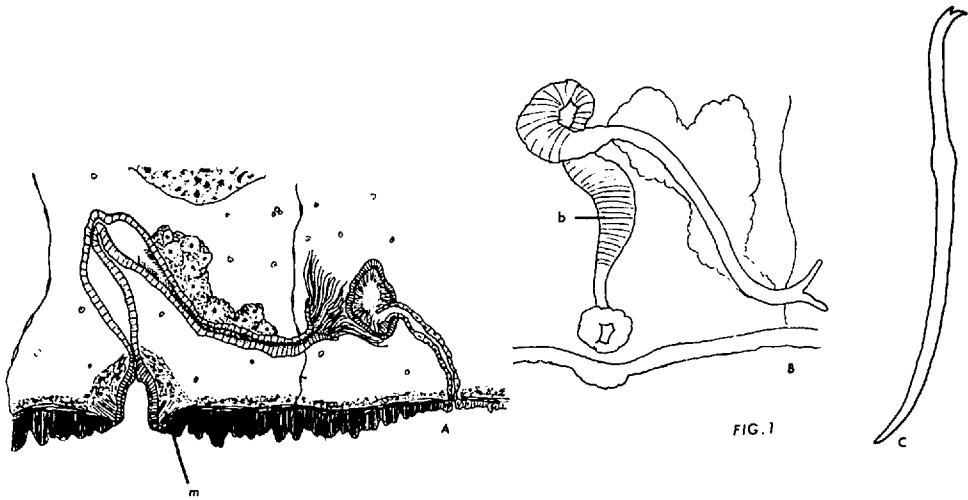


Figure 1. *Monopylephorus helobius*. A, male duct; B, male duct during bursal collapse; C, seta. b, bands of circular muscle surrounding the distal part of the male duct; m, muscle fibers apparently utilized for bursal collapse.

μm wide; ducts approximately $20\ \mu\text{m}$ diameter, $150\ \mu\text{m}$ long; pores opening in line with ventral setae, in intersegmental furrow 9/10 or immediately posterior to furrow. Spermatzeugmata not formed. No modified genital setae.

DISCUSSION

There have been numerous reviews of the synonymies and justifications for using either *Monopylephorus* or *Rhizodrilus* for the generic name (Chen, 1940; Marcus, 1949; Hrabě, 1967; Brinkhurst, 1963, 1971). I am using *Monopylephorus*, as it appears to be more widely used and more likely to provide stability.

The nomenclature of the portions of the male ducts of most species of this genus has, until recently, been in a state of flux. Hrabě (1967) and Brinkhurst (1971) appear to agree that the portion covered by prostate tissue is the atrium, that the frequently short, proximal portion free of prostate tissue is the vas deferens, and that the swollen portion terminating in the bursa is the pseudopenis. This is the nomenclature used in the description of *M. helobius*. This system is based largely on Hrabě's (1967) definition of the tubificid atrium as that portion of the male duct receiving the prostate; it is seemingly inconsistent when *Monopylephorus* species with tubular atria are compared with species of other tubificid genera with swollen atria and tubular vasa deferentia.

Monopylephorus helobius is part of a complex of species with male ducts that are quite similar. The new species seems to show affinities to *M. limosus* and *M. rubroniveus*, particularly that form of the latter described by Marcus (1949) as *M. corderoi*. The distal part of the atrium of *M. helobius* is dilated (Fig. 1A, B). This was found to vary from only slightly wider than, to over twice the diameter of, the prostate-covered, proximal portion of the atrium. A condition of atrial dilation was previously described for *M. limosus*, in which the dilation, termed the "first atrium" by Chen (1940), was located proximally along the male duct, and was covered with prostate tissue. The *M. corderoi* "transverse duct" (Marcus, 1949), a connection between the tubular, prostate-covered atrium and the pseudopenis, appears slightly expanded in the illustration accompanying the de-

scription. It is similar to the distal, naked portion of the *M. helobius* atrium, but it is ciliated, whereas that of *M. helobius* is not.

If Brinkhurst's (1971) synonymy of *M. corderoi* and several additional species with *M. rubroniveus* is accepted, dilations of the male ducts could be considered trivial. *Monopylephorus helobius* would differ from the entire complex by characters of the pseudopenes and the setae. The pseudopenes of *M. rubroniveus* are stated to have a cuticular lining (Brinkhurst, 1971); none was detected in sections of *M. helobius*. The setae of *M. rubroniveus* have distal teeth that are longer than, or subequal to, the proximal teeth. In *M. helobius* the distal teeth are always shorter than the proximal.

The form of the setae of *M. limosus* is almost identical to that of *M. helobius*; the former, however, has simple-pointed crotchets ventrally in II, while in the latter the ventrals of II are bifid. The possibility exists that the simple-pointed setae of *M. limosus* were produced by wear. However, it seems probable that the same wear would alter the form of the ventral setae of III and beyond. Chen (1940) noted that *M. limosus* is associated with situations "containing a large quantity of organic debris;" such a habitat is not conducive to setal wear.

The prostate tissue of both *M. limosus* and *M. corderoi* appears to be symmetrically arranged about the atrium. Nomura (1915) and Marcus (1949) illustrated the prostate as being closely associated with the atrium, and surrounding it. In *M. helobius* the shape of the mass of prostate tissue is quite variable, but it is usually dorsal to the atrium.

The placement of the clitellum differs among the three species. It extends from 9/10 to 12/13 in *M. helobius*, 9/10 to XIII/2 in *M. limosus*, and X/2 to XIII/2 in *M. rubroniveus*.

Muscle fibers in the atrial wall have been described for *M. rubroniveus* by Goodrich (1895) and *M. ponticus* (Hrabě, 1967), the latter considered by Brinkhurst (1971) to be a synonym of *M. rubroniveus*. The fibers of those species differ from the relatively thick, dense bands of circular muscle that extend from the ciliated portion of the atrium to the distal part of the pseudopenis of *M. helobius* (Fig. 1B: b).

Diagonally arranged muscle fibers were discovered surrounding the mid-ventral bursa of segment XI (Fig. 1A: m). A contraction of these fibers would appear to result in bursal collapse. The columnar cells surrounding the male pores protrude from the body wall and appear to produce penial papillae during the collapse of the bursa (Fig. 1B), thus apparently aiding in intromission. This raises the question of referring to the entire terminal dilation of the male duct as a "pseudopenis" when it appears not to function as such.

Monopylephorus helobius has been collected from three different habitats. The type-locality is a *Spartina alterniflora* marsh where the salinity varied from 11 to 24‰. The second locality is a fresh-water swamp in southeastern Louisiana with a salinity of less than 1‰. The third locality is the Pecos River in western Texas (salinity 3.5–9‰) where the species occurred with other typically brackish-water organisms (J. R. Davis, pers. com.).

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